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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,527

07/11/2005

Christopher John St Clair Webber

04-807

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11/20/2008

MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP

300 S. WACKER DRIVE

32ND FLOOR

CHICAGO, IL 60606

EXAMINER

ABEBE, DANIEL DEMELASH

ART UNIT

PAPER NUMBER

2626

MAIL DATE

DELIVERY MODE

11/20/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/509,527

**Applicant(s)**WEBBER, CHRISTOPHER JOHN  
ST CLAIR**Examiner**

Daniel D. Abebe

**Art Unit**

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 9, 13-15, 17, 25-27, 29, 34 and 38-41 is/are rejected.
- 7) ☒ Claim(s) 3, 5-8, 10-12, 16, 18-24, 28, 30-33 and 35-37 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

### ***Specification***

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 40 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The computer program as claimed in claim 40 is directed to non-statutory functional descriptive material that does not fall within one of the four categories of patent eligible subject matter recited in 35 U.S.C. 101 (process, machine, manufacture or composition of matter).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

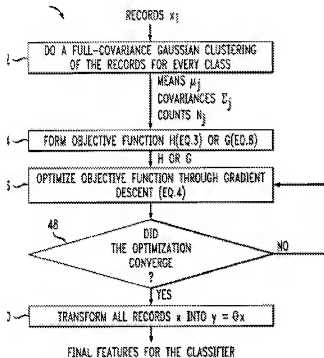
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4, 9, 13-15, 17, 25-27, 29, 34, 38-39 and 40-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Gopinath et al. (6,609,093).

As to claim 26, Gopinath teaches a method of processing a signal, the signal comprising a plurality of data encoding vectors (feature vectors,  $X_j$ ) wherein the vectors are derived/extracted from digitized input signal patterns and where the method employs Gaussian model having at least one class mean having multiple components and where the class mean (class distribution) is optimized in an iterative manner,

Characterized in that the class mean associated with the feature vectors (objective functions) within a projection matrix are maximized (class distribution

discrimination is maximized) during the optimization procedure such that the maximized class distribution discrimination in a projected space have constant modulus (dimensions) at each iteration and where the vectors input to the Gaussian model are normalized/transformed using the projection matrix (Figs.1-4; Col.2, line 52-Col.3, line 30; Col.8, lines 23; Col.8, lines 45-50; Col.10, lines 15-35; Col.11, lines 40-55; Col.8, lines 19-23).



As to claim 27, Gopinath teaches wherein the covariance matrix in the objective function have elements which are constrained during the optimization procedure and where the matrix is isotropic (multi dimension or dimensional) and diagonal and where irrelevant dimensions are ignored (remain constant) during the optimization (Col.11, lines 40-55; Fig.3; Col.10, lines 40-58).

As to claim 29, Gopinath teaches where in the feature vectors are processed by the discriminant analysis model before being put into the classifier module where the dimensions irrelevant to the class are ignored (Fig.2).

As to claim 34, a GMM providing observation probabilities to an HMM model is the function of GMM models and therefore inherent in Gopinath teaching.

As to claims 38-39, Gopinath teaches where the dimensional values may vary for the class and a signal processing system for performing the method (Col.8, lines 23; Col.8, lines 45-50; Col.10, lines 15-35; Col.11, lines 40-55).

As to claim 41, Gopinath teaches where the signal processing system is speech recognition (Figs.1-4).

As to Claims 1-2, 4, 9, 13-15, 17, 25 and 40 the signal processing system including speech recognition and the computer program for performing the claimed processes which are recited in the corresponding method claims addressed above are taught by Gopinath (Fig.1-4; abstract; Col.8, lines 24-65; Col.9, lines 55-65)

***Allowable Subject Matter***

Claims 3, 5-8, 10-12, 16, 18-24, 28, 30-33 and 35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 28, Gopinath doesn't teach where prior class probabilities associated with the models are constrained to be equal and to remain unchanged through out the optimization process.

As to claim 30, Gopinath doesn't teach where the dimension (modulus) of each feature vector is independent of the over all power in the vector.

As to claims 31-33 and 35-37 Gopinath doesn't teach where the feature vectors are arranged and elements added to each vector and where the components are derived from the GMM's posterior probability as recited in the claims.

Claims 3, 5-8, 10-12, 16, 18-24, claiming the system for performing the same method claimed in the respective method claims are allowable for same reasons.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel D. Abebe whose telephone number is 571-272-7615. The examiner can normally be reached on monday-friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel D Abebe/  
Primary Examiner, Art Unit 2626